

WHAT IS CLAIMED IS:

1. A process for preparing halogenated alkanes comprising:
reacting a haloalkane and a haloalkene in the presence of a metal chelating agent
to produce a halogenated alkane.
2. The process of claim 1 wherein the haloalkane comprises CCl_4 .
3. The process of claim 1 wherein the haloalkene comprises vinyl chloride.
4. The process of claim 1 wherein the metal chelating agent contains phosphorous.
5. The process of claim 4 wherein the metal chelating agent comprises a trialkyl phosphate.
6. The process of claim 5 wherein the metal chelating agent comprises tributyl phosphate.
7. The process of claim 1 wherein the reaction occurs at about 105°C.
8. The process of claim 1 wherein the reaction occurs at a pressure of about 5-15 psig.
9. The process of claim 1 wherein the haloalkane and haloalkene are present at a ratio of about 1.07:1
10. The process of claim 1 wherein the preparation of halogenated alkanes is continuous.
11. The process of claim 1 wherein the preparation of halogenated alkanes occurs at subatmospheric pressure.
12. The process of claim 1 further comprising:
reacting the halogenated alkane to form a halogenated alkene; and
reacting the halogenated alkene, either in a single or multiple steps to form HFC-245fa.
13. A process of preparing a halogenated propene comprising:
reacting a halopropane in the presence of a Lewis acid catalyst to produce a halogenated propene.

14. The process of claim 13 wherein the halopropane comprises 1,1,1,3,3-pentachloropropane.
15. The process of claim 13 wherein the Lewis acid comprises FeCl_3 .
16. The process of claim 13 wherein the halogenated propene comprises 1,1,3,3-chloropropene.
17. The process of claim 13 wherein the reaction occurs at a temperature of about 70°C.
18. The process of claim 13 wherein the halopropane is produced from a reaction of a haloalkane and a haloalkene.
19. The process of claim 13 wherein the preparation is continuous.
20. The process of claim 13 wherein the preparation occurs at subatmospheric pressure.
21. The process of claim 13 further comprising reacting the halogenated propene, either in a single or multiple steps to form HFC-245fa.
22. The process of removing HF from a mixture containing HF and a halogenated hydrocarbon comprising:
 - combining a mixture containing HF and a halogenated hydrocarbon with a solution of inorganic salt and HF; and
 - recovering a substantially pure halogenated hydrocarbon from the mixture.
23. The process of claim 22 wherein the halogenated hydrocarbon comprises HFC-245fa.
24. The process of claim 22 wherein the inorganic salt comprises KF..
25. The process of claim 22 wherein the solution of inorganic salt and HF is maintained at a temperature of about 90°C.
26. The process of claim 22 wherein mole ratio of inorganic salt to HF is about 1:2.
27. The process of claim 22 further comprising regenerating said solution of inorganic salt and HF by removing HF so that the mole ratio of inorganic salt to HF is sufficient for removal of HF from a mixture containing HF and a halogenated hydrocarbon.

28. The process of separating HFC-245fa from HCFC-1233zd comprising:
distilling a mixture of HFC-245fa and HCFC-1233zd to produce a first distillate rich in
HCFC-1233zd and a bottom rich in HFC-245fa; and
distilling said bottom to produce a second distillate of essentially HCFC-1233zd free
HFC-245fa.

29. The process of claim 28 wherein the first distillate is recycled to a halogenation
reaction.

30. The process of claim 28 wherein the mixture of HFC-245fa and HCFC-1233zd is
the product of a halogenation reaction.

31. The process of separating HFC-245fa from a mixture containing HFC-245fa and
HCFC-1233zd comprising:

distilling a mixture containing HFC-245fa and HCFC-1233zd in the presence of
HF to produce a HFC-245fa bottom free of HCFC-245fa and a distillate.

32. The process of claim 31 further comprising recycling the distillate to a HFC-245fa
production reaction.

33. A process for the production of HFC-245fa comprising: (1) reacting carbon
tetrachloride with vinyl chloride to produce 1,1,1,3,3-pentachloropropane; (2)
dehydrochlorinating the 1,1,1,3,3-pentachloropropane with a Lewis acid catalyst to produce
1,1,3,3-tetrachloropropene; (3) fluorinating the 1,1,3,3-tetrachloropropene to produce HCFC-
1233zd; (4) fluorinating the HCFC-1233zd to produce a product mixture containing HFC-245fa;
and (5) separating HFC-245fa from the mixture.

34. A process for the production of HFC-245fa comprising: (1) reacting carbon
tetrachloride with vinyl chloride to produce 1,1,1,3,3-pentachloropropane; (2)
dehydrochlorinating the 1,1,1,3,3-pentachloropropane with a Lewis acid catalyst to produce
1,1,3,3-tetrachloropropene; (3) fluorinating the 1,1,3,3-tetrachloropropene with HF in the liquid
phase to produce HCFC-1233zd; (4) fluorinating the HCFC-1233zd with HF in the liquid phase
in the presence of a fluorination catalyst to produce a product mixture containing HFC-245fa, HF
and HCFC-1233zd; (5) contacting the product mixture from step (4) with an HF/inorganic salt

PATENT APPLICATION
GRLK-033-01

solution mixture to produce a product mixture containing HFC-245fa, as the major component, and minor amounts of HF and HCFC-1233zd; and (6) distilling the product mixture from step (5) to produce a bottoms product containing HFC-245fa and a distillate portion containing HF and HCFC-1233zd.

35. The process of claim 34 further including the step of purifying the bottoms product from step (6) to remove traces of acid and/or water from the HFC-245fa product.